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AN ESTIMATE OF FERTILITY IN SOME YAO HAMLETS IN LIWONDE DISTRICT OF SOUTHERN NYASALAND*

J. CLYDE MITCHELL

1. Introduction

KUCZYNSKI has drawn attention to the deplorable incompleteness of censuses of colonial populations.[1] In order to make estimates of population trends among non-literate peoples, therefore, we have to rely on the analysis of samples drawn at random from the population as a whole.[2] The difficulties to be surmounted even for so limited an objective are considerable.

The first and most difficult problem is that of securing what may be considered a statistically random sample. Often there are not even accurate maps of the areas to be surveyed, and sometimes Administrative records of such larger units as villages are inaccurate. The universe from which the sample is to be drawn is thus often unmeasured and unknown. Even when this difficulty is overcome there are yet other practical problems to be solved. These may include factors such as climate, disease, inaccessibility of some areas, which militate against a successful survey.

However, most serious of all from the demographer's point of view is that much of the information that he wishes to obtain is difficult to obtain from non-literate people. Usually there is some suspicion and reticence in giving information about numbers of people,[3] and this implies that the investigator has first to gain the confidence of the people with whom he is working. Another set of difficulties is encountered because the people themselves cannot easily answer questions framed in concepts with which they are not familiar. Probably the most commanding of these is the question of ages of individuals, since few, if any, non-literate people reckon age in years as we are accustomed to do. Investigators must therefore be led to some method of estimating age. This can be done in different ways, depending on the people studied. Thus, for example, some people have what are called age-regiments into which all members of the tribe are inducted periodically (about every five or six years in the case of the Tswana of the Bechuanaland Protectorate) when they reach adulthood. Where there are no such indigenous systems, a chronology of events may have to be executed as was done in the survey upon which this paper is based.

* I am grateful to Dr. M. Fortes and Dr. M. Gluckman of the Institute of Social Anthropology, Oxford, to Mr. J. C. Mann of the Rhodes-Livingstone Institute, and to Dr. Enid Charles, Central Statistical Office, Hemingford City Council, all of whom have read the draft of this paper and suggested some improvements. The responsibility for the conclusions and the statements made is of course entirely mine.

[1] A. R. Kuczynski, *Colonial Population*, London: Royal Institute of International Affairs (1937). This has been reprinted in *Rhodes-Livingstone Journal*, no. 1 (Dec. 1946), as "Population Development: The Contribution of Demography to the Study of Social Problems", pp. 10-18.

[2] Sometimes drawn attention to the value of such samples is L. Sundstrom, "Demographic Samples in the Study of Backward and Primitive Populations", *Irish African Journal of Economics*, vol. 8 (Dec. 1945).

[3] Some of the difficulties in conducting demographic surveys among non-literate peoples are described by Enid W. Digard. In particular he recounts the steps the Bechuanaland had agreed to give census information to the Palestine Administration then charged their minds and refused to do so when the Anglo-American Commission's report on Palestine was published. Enid W. Digard, "The Enumeration of the Bechuanaland Protectorate in May 1946", *Population Studies*, vol. 1, no. 3 (Dec. 1947), p. 300.

121 Often there is some cultural obstruction to the giving of information of certain types. The Yao, for example, will not readily mention the names of deceased persons. Often young children or people who themselves had no children are completely forgotten. Many polygynous men cannot remember the number of children that they have fathered.

114 Nevertheless, in spite of these and other similar difficulties, some investigators
121 have been able to publish a certain amount of material bearing on the problem of the rate of increase of non-literate populations in Africa. All of them have been based on samples, though some of these could be considered statistically representative. Such studies in recent years include one in Southern Nigeria,[1] one from Tanganyika[2] based on a substantial sample of women, while M. Fortes has published some material on the Tallensi of the Gold Coast.[3] Schapera, incidentally to a larger study, has published some material on the Tswana of Bechuanaland Protectorate.[4]

The analysis of the Yakö by Enid Charles and C. Daryll Forde was mainly concerned with the calculation of the male net reproduction-rate, while the Culwicks and Schapera calculated female net reproduction-rates. Fortes considered both the male and female net reproduction-rates. The Culwicks have so far presented the most complete analysis of this type of material but were not able to classify their material into five- or ten-year age-groups, though they did use a wider age classification. The Culwicks, Fortes, and Schapera have all used the number of girls born to women over post child-bearing as an estimate of the female gross reproduction-rate. There are objections to this procedure which are outlined below. ✓

121 In this paper an attempt is made to present in more detail some demographic material on an African non-literate people. The main object of the paper is to estimate the probable gross and net reproduction-rates prevailing at the moment
125 in the area studied. The data on which this paper is based were collected incidentally to a study of the social organization of the Yao people living in the Liwonde District of Nyasaland in Central Africa.[5] In this study a number of typical hamlets, ranging from 3 to 30 or more dwellings, were visited and genealogies of the residents recorded. In 20 of these hamlets further details were secured on points of demographic interest. Each census in a village took a day or two, and individual censuses were taken between November 1946 and March 1947. In this analysis of the material I have assumed that the survey was done at the end of 1946. The survey was conducted on a *de facto* and *de jure* basis in that the population who had slept in a hamlet the previous night was enumerated, but the mobility of the population is so high that usually it was necessary to consider a *de jure* census as constituting the true population of the village. The twenty hamlets studied were grouped in three areas, two in the area under H. A. Kawinga and one in H. A. Njembi's area.

[1] Enid Charles and C. Daryll Forde, "Notes on Some Population Data from a Southern Nigerian Village", *The Sociological Review*, vol. xxx, no. 2 (April 1938).

[2] A. T. and G. M. Culwick, "A Study of Population in Ulanga, Tanganyika Territory", *The Sociological Review*, vol. xxx, no. 2 (April), p. 96, and vol. xxxii (1939), no. 1, p. 25.

[3] M. Fortes, "A Note on the Fertility among the Tallensi of the Gold Coast", *The Sociological Review*, vol. xxxii, no. 2 (July-Oct. 1940).

[4] I. Schapera, *Migrant Labour and Tribal Life*, London: Oxford University Press (1947), pp. 10 ff.

[5] This study was conducted as part of the Rhodes-Livingstone Institute's comparative study of the social organization of some Central African tribes. I am grateful to the Trustees of the Institute and to the Director, Dr. E. Colson, who have given me permission to publish this material.

They do not form a representative sample though they were casually selected for study and are fairly well scattered in the district in which they are situated.

In all there were 360 men, women, and children normally resident in the headmen. This represents about 1·2 per cent. of the total population of the area. By normally resident, I mean that these people are considered to be members of the headman, and if they were absent, were away on only short visits of, say, about a month.

I have thus counted polygynists as normal members of the headmen, but have taken care to ensure that they were not included again if their second wives were in another headman of the groups studied. Men, women, and their children who had gone outside the area to seek work, for example, were not included.

The ages of all members of the population were estimated by relating the birth of the individual to some notable event, the date of which is known. In these headmen it was always possible to find some old relative who could place the birth of younger people as occurring between notable events. After the two dates between which the birth occurred had been fixed, it was then possible to fix the date of birth more accurately by asking the older people to indicate the approximate size of the child at subsequent events, by picking out a suitably sized child in the village.

The following is the skeleton chronology used in this survey.

1870 Migration of Kawinga group from Kongwe Hill.
1881 First attack by the Mshewangwara Angoni.
1884 Second attack by the Mshewangwara Angoni.
1895 British attack on Mwase Chikala, the stronghold of Kawinga.
1898 British attack on Mgwata Mangochio, the stronghold of Jalasi.
1901 Death of Kawinga of the Bagulili.
1907 The departure of Mr. Hoare, Collector of Revenue, from the Chikala Station.
1908 Small-pox epidemic.
1913 Government registrations about the number of huts in a village (District Administration (National) Ordinance, 1912).
1914 Commencement of the First World War. This is a notable event because of the fighting in German East Africa, in which many Hyundreds Africans troops took part. Also many men were used as porters carrying war goods from the railhead at Port Johnston on Lake Nyasa.
1918 End of First World War.
1919 Influenza epidemic.
1921 General famine. This is known locally as *ndo ya Jim*, lit. "the hunger of Jim". Jim was an African Government clerk whose duty it was to dispense food to the starving populace.
1930 The coming of the famous *mchape* witchfinders. These people, trading on the beliefs of the populations, induced practically the entire people to drink a potion to prove themselves free witchcraft. It is a most memorable event in the history of the area.*
1933 The introduction of Indirect Rule.
1940 The commencement of recruiting for the Second World War. The Liwonde district supplied a good proportion of men for the Army.
1946 End of the Second World War, i.e. the return of the soldiers.

The important thing about such a chronology is that the events should be deeply

* For details of this movement since it had penetrated to Northern Rhodesia, see A. I. Richards, "A Modern Movement of Witchfinders", *Africa*, vol. viii (1935), pp. 448-61.

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improved on people's memories and remembered by most of the people. Thus it was desirable to find a useful reference date between 1930 and 1940. It might be thought that the death of King George V would be memorable. However, though all who were old enough at the time could remember the watchfulness, only a few could remember the death of King George.

This skeleton chronology was filled in by events of more local significance. For example, Kavinga's brick house was built in 1929, the present Hyambi succeeded in 1933, &c. In addition, in particular hamlets there were men who had been in the Army, or had been to work in South Africa or Southern Rhodesia. Usually they could recall the date of going and sometimes of return, though they may have lost count of the intervening years. Such dates were often useful points. A small minority had actually recorded the dates of birth and death of children.

In addition to this, it was possible to fix the ages of the young children by reference to harvests, since the Yao reckon two years to correspond, 'last year' meaning before the last harvest and 'the year before last' meaning the period before the harvest before last. Before the year before last, all time is merely kale kale, the only indication of the period being the pitch of the voice in which it is said or the presence or absence of an exclamatory 'E!' before speaking.

Particular care was taken to secure the ages of women and the dates at which they had borne children. There was, as mentioned above, some reticence in mentioning the names of dead children, but this was usually met successfully by questioning the women's male relatives who were generally more communicative on these points. In spite of the care taken to obtain this information, it was impossible to fix the ages of six women in the sample, and they have been excluded from the major part of the analysis. In addition, there were thirty-nine men who were not available for questioning. These were all adults, the husbands of women in the hamlets. The Yao are matrilineal and matrilocal, and men tend to spend much of their time away from the hamlets of their relatives-in-law. Since they are in many ways strangers in the hamlets no information could be obtained about them.

2. The General Background to Fertility

All the hamlets visited were occupied by members of the Yao tribe. The Yao are an Islamized people who achieved the questionable distinction of being effective slave raiders at the end of the nineteenth century. They are a matrilineal and predominantly matrilocal people living in hamlets of from about 5 to 100 huts or more.

Table I. *Age of Women at First Marriage*

Age of women at first marriage													
Number of women	1	6	1	10	8	6	5	3	...	...	...	50	18·3
Percentage	2	12	2	20	16	12	10	6	...	...	...	100	18·3
Cumulative percentage	...	...	...	...	...	...	...	...	...	...	...	...	18·3
Totals	2	14	16	36	52	64	74	80	...	86	92	100	100

They are semi-subsistence cultivators who own no cattle and whose diet is therefore largely vegetarian, viz. sorghum and maize meal with ground-nuts and beans and certain leaves together with a small quantity of cassava roots.

Marriages are contracted early in life with little difficulty and ceremony. Formerly girls were espoused as mere children, and this still happens, but whether the custom is falling away or not I could not check quantitatively because the memories of the old women who had been married as children forty or fifty years ago could not be relied upon. Table I shows the ages at first marriage for a sample of 101 married women for whom this information was available.

Where marriage takes place so early we can expect that the mean age when child-bearing commences will also be early. Table II shows the median age of mothers at the birth of their first child.

TABLE II. *Age of Mother at Birth of First child*

Present age groups of mothers	Age of mother at birth of first child									Total	Median age at birth of first child
	10-14	15-17	18-20	21-23	24-26	27-29	30-32	33-35	Over 35		
Under 20	2	16	14	12	6	2	—	—	—	52	17.9
20-29	10	19	16	8	6	3	1	2	1	66	19.5
30 & over	1	2	3	2	3	2	1	1	1	16	21.6
Totals	13	37	33	22	15	7	2	3	2	134	19.1

From these two tables it is clear that nearly all women in the community are married early and that child-bearing commences very soon after marriage.

Table III shows the conjugal status of all women over the age of 15.

TABLE III. *Conjugal Status of all Women over the Age of 15*

Present age groups	Never married	Wives of			Widows	Divorcees	Total
		Monogamists	Polygamists	Junior wives			
Under 20	19	12	2	0	—	—	33
20-29	5	53	18	0	2	1	79
30 & over	1	19	10	1	2	2	35
Grand Total	—	14	10	1	4	3	32
Total	25	98	40	2	8	6	179

Here we see that of all women under 20 (19.6), 140 (72 per cent.) are married, though only 54 (28 per cent.), i.e. the wives of monogamists, have their husbands living permanently with them. Another 40 (20 per cent.) were married to men who were married to other wives, so that while their husbands were not living with them permanently they were nevertheless with them periodically. Eighteen other women (9 per cent.) were married to men who had left to work outside the area and hence were not living with their wives at all at the time of the survey. Visits by men to places of work outside the area may last a years or more. It should

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It would thus only [illegible] per cent. of the whole sample of 198 women—had never married and that 15, or 7 per cent., of these (or 10 per cent. of the total) were under the age of 20 and therefore stood a good chance of yet marrying. Furthermore, 2 of the 4 women over 20 who had not married were known definitely to be incapable of marrying (one is insane and the other has violent epileptic fits).

There were 33 women who were divorcees or widows (16.7 per cent.), but it should be noted that 17 (or 11 per cent. of the 198 women) were over the age of 45 and therefore were past, or nearly past, the child-bearing period. Those in the younger age groups stood good chances of remarrying. Table IV shows that though the divorce rate is high¹ remarriage is common. By the time a woman's child-bearing period has ended she has been married on the average 1.7 times. Five marriages are contracted after child-bearing ceases.

Table IV. *Marriage and Dissolution of Marriage experienced by all Women over the Age of 15*

Present age	No. of women	No. of marriages contracted	No. of divorces experienced	No. widowed	No. still married	No. of marriages per woman	No. of divorces per woman	No. of marriages per woman ended by death of husband	No. of marriages per woman still existing
15–19	40	10	1	—	10	0.25	0.03	0.00	0.25
20–29	58	104	26	4	84	1.79	0.45	0.07	1.45
30–39	51	112	20	8	84	2.20	0.39	0.16	2.04
40–49	31	68	14	16	38	2.19	0.45	0.52	1.67
Over 49	18	38	4	5	29	2.11	0.22	0.28	1.83
Total	198	332	65	33	245	1.68	0.33	0.17	1.51

These statistics, showing the early age of marriage, the early commencement of child-bearing, the high incidence of marriage among women, and the high rate of remarriage during the child-bearing period, all point to the high valuation of reproduction reflected in Tao culture. This is consistent with their social structure, where the major corporate groups are kinship groups and reproduction is the principal method of recruitment to the group. Furthermore, because the standard of living is almost at subsistence level, children do not entail the economic losses they do in Western society. On the other hand, they are expected to support their aged parents when they themselves are economically independent. In other words, there are few factors militating against reproduction and many in favour of it.

We may expect the beliefs and customs surrounding child birth to reflect the value of reproduction. For instance, the Tao distinguish clearly between women who have borne children and those who have not. When a girl becomes pregnant for the first time she undergoes a special ceremony (*fēidāo*) attended only by women who have borne children. This ceremony has many of the features of a *rite de passage* and appears to mark the passing of the woman to a new social status. Furthermore, women are ascribed status according to the number of children they have borne. The word *sumuō* signifies a young woman who has not yet borne a child; *sumuō*

¹ Between a third and a half of the marriages contracted by women had been dissolved by divorce by the time that the child-bearing period had ended.

ahuda, a woman who is pregnant for the first time; *kamakwa*, a woman who has one or two children; *ajumbwa*, a woman who has three or four children, and *hatiyi ahuba*, a woman who is past child-bearing age.

The information which I have been able to collect on abortifacients and contraceptives suggests that they are not used by married people merely to prevent their having more children, but that they are used by people who wish to avoid pregnancies which would be embarrassing, for example, by a woman whose husband is a labour migrant. To what extent the abortifacients and contraceptives are effacacious I cannot say; some, I know for certain, rely on a magical principle, for example, the medicinal cord worn by a man during intercourse. On the other hand, the abortifacients taken orally may have some active ingredients.

A barren woman or an impotent man is regarded with some embarrassment and the marriage ceremony (*ukwenyagwa*) of a childless couple will go to considerable lengths and expense considering divorce and barrenness in an attempt to make their union productive. Childless couples are regarded as not fully adult and are treated in a patronizing way by those who have borne children. Since a man may marry other wives, barrenness in a woman is a cause of sorrow to her husband, but is not in itself a ground for divorce. Where the man is impotent, however, the woman may divorce him on this ground, though she usually takes a paramour and leaves her husband to so arrive for damages which ceremonially leads to a divorce because it is the usual practice in these cases for the court to ask the woman if she wants to be divorced from her husband.

In contrast to the satisfaction shown at the birth of a child is the sense of sorrow evinced when a child is still-born or the woman miscarries. The Yao do not distinguish between still-births and abortions, both events being known by the word *ihonenge*. This is a verb and refers to the process of abortion; there is no term for the dead foetus itself. I made no attempt to enumerate miscarriages and still-births because they are supposed to be due to breaches of sexual taboos on the part of the husband and wife, and interviewees were naturally reluctant to mention them. Miscarriages and still-births are greatly feared, and the woman is considered to be in a very dangerous condition until she and her husband have carried out a ritual purification. Should a man have intercourse with a woman who has miscarried and not yet been purified he will contract a disease called *kusa* which is believed to be incurably fatal. Still-born children or aborted foetuses are buried in a hole dug with sharpened sticks in the bush by the women, whereas children who are born alive and die afterwards are buried in the graveyard in graves dug by men with hoes. The buried spots of still-born babies or aborted foetuses are marked with a stone or broken pottery, since it is believed that to step on them will induce an illness.

The concern of the immediate kin-groups is shown in the child-birth procedure. Both normally take place in a hut in the presence of the older female relatives of the woman and the female representatives of the man. The husband's representatives are necessary because the Yao, like many other Central African peoples, believe that an adulterine child will not be born to the woman unless the confessor (*kapisi*) the name of the genitor. If the genitor is concealing the identity of the genitor, they

* *ahuba* = elephant, hence many. The same term and *ahuda* have both refer to the many heads traditionally worn by the women in the pregnancy initiation ceremony.

177 believe that she will die. The men's superstitions are therefore able to establish the child's paternity from the birth-pang confessions of the women.

176 The child is kept in the hut where it was born, for six or seven days, while the umbilical cord dries and falls off. During this time (half) the child is unnamed, and it is named only when it is taken out of the hut. Should it die during this period of seclusion it receives unnamed and is referred to by a special term (*Hingu, pl. mangu*).

(118) I have therefore been able to enumerate live births by means of the distinction made between miscarriages and still births (*Awunga*) and children who lived long enough to be referred to as *mangu*. After the birth of the child the women may not have intercourse for four or five months. To do so would be to endanger the life of the

(172) child with a disease called *mbeke*,[1] which is contracted by a sexually inactive person when he comes into contact with a sexually active person. The husband may have intercourse with a second wife, but must take care to sacrifice himself so that he does not endanger the life of his child. When the child is about 4 or 5 months of age the parents perform *ritual* intercourse and sacrifice the child against the mystical dangers of sexual activity; sexual relations are then resumed.

173 The Tao say that a second child should not be born while the first is still being

(165) suckled. Since lactation continues for about two years I am uncertain whether monogynous women continue, as they say they do, or whether some interruption is practised. It is quite usual for husbands to become labour migrants when their

174 children are still very young. I have known women to write to their husbands who are away working and tell them to return because their children have 'grown', i.e. have been weaned. Labour recruiters had difficulty in recruiting men immediately after the soldiers had been demobilized at the end of the war, because the women objected, saying that they had remained childless long enough and the men must first wait until children were born. However, actual examination of birth-dates

(164) shows that children are sometimes born within a year of one another and sometimes there are quite big gaps. The two-year gap between children is probably an ideal which few attain.

5. THE STRUCTURE OF FERTILITY

(a) *Sundberg's Age Division*

128 As a preliminary estimate of fertility, Sundberg's nichenomy of ages may be considered. The argument behind this division of the population into Youth, Middle Age, and Old Age is that those populations with a high proportion of youth have a greater tendency to increase. Table V shows this nichenomy for the Tao with the same material for some other populations shown for comparison. Where the gross reproduction rate is known for the period shown in the table, this is included.

128 At any one time a certain proportion of the population is absent from the area, 14.5 usually at some labour centre. Hence the proportions of the population are distributed abnormally. In all there appeared to be a total of sixty-three men, women, and children absent from the hamlets, who would otherwise have been living there. Those in Table V there have been included in the totals in the "Tao with absentees" proportions.

(191) [1] A disease of this sort is believed to be many Central African tribes. Among the Nyasa-speaking peoples it is known as *mapele*.

Table V shows that the age distribution for the Tao sample is very similar to certain other populations commonly held to have high birth-rates. There appears to be some correlation between the proportion of youth in a population and the gross

Table V. *Lundwe's Age Division*

Population	Year	Youth 0-15	Adult age 15-45	Old age over 45	G.R.R.
Tao	1946	45%	45%	10%	—
Tao with allowance	1946	45%	45%	10%	—
Mexico	1940	45%	45%	10%	—
Ceylon	1946	45%	45%	10%	—
Canada	1941	34%	54%	12%	—
India	1941	38%	51%	11%	—
Japan	1940	36%	53%	11%	1.38
Egypt	1937	38%	51%	11%	1.36
Czechoslovakia	1930	27%	57%	16%	1.00
New Zealand	1936	29%	57%	14%	1.03
Denmark	1930	25%	57%	18%	0.89
Sweden	1930	24%	57%	19%	0.85

* These refer to the sample whose ages were not known. These were all adults and have been included proportionately in the two adult groups.

† All data for other populations taken from *The League of Nations Statistical Yearbook* 1940/41.

‡ Interpolated between ages 0-14 and ages 15-45.

reproductive rate. Judging from the material presented in Table V a high gross reproductive rate may be expected among the Tao where the proportion of youth is much higher than in the case of those whose gross reproductive rates are quoted.

(b) *The Proportion of Children under 5 to Women 15-50*

Fertility may be judged more accurately than by this indirectness by considering the proportion of children under 5 to the total number of women between the ages of 15 to 50, i.e. the fertility ratio.[1] In the whole sample there were 147 children under 5 and 150 women between the ages of 15 to 50. This is a ratio of 980 children per 1,000 women. However, women who are going away from the area for a long time, as, for example, wives of men who are going with their husbands to some labour centre, possibly in South Africa or Southern Rhodesia, usually leave their weaned children with their matrilineal relatives. This means that the ratio quoted (980 per 1,000) is, in reality, an over-estimate of the true ratio. In order to arrive at a nearer estimate of the ratio we must consider the children actually born to women in the sample. Table VI therefore all children both dead and surviving born to women between the ages 15 to 50. From this table we address that there were 150 women between the ages 15 to 50 (for whom details were available), and among them they had 140 surviving children under the age of 5. This is a fertility ratio of 938 per 1,000 women. Table VII shows the fertility ratio for 18 countries with their gross reproduction rate for the same period as the fertility ratio.

[1] It is more usual to take the number of women between 15 and 45, though usually the age group between 45 and 50 is left out. I have taken the age limits 15 to 50 because of the early age of marriage, and because it appeared that the average age of cessation of childbearing is about 50 (see Table VIII). For a discussion of the suitability of this measure of fertility where birth registration is not practised, see P. Lamy Smith, *Population Analysis*, McGraw-Hill Book Co., New York (1948), p. 138.

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Table VI. Live-born Children, Alive or Dead at Time of Survey. Mothers aged 15 to 55

Age of children at time of survey	Mothers	Alive or Dead	Number of years elapsed since birth of child								Totals
			0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	
0 to 1	0	A	— —	0 0	— —	0 0	— —	0 0	— —	0 0	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
1 to 2	1	A	— —	— —	0 0	— —	0 0	— —	0 0	— —	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
2 to 3	2	A	— —	— —	— —	0 0	— —	0 0	— —	0 0	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
3 to 4	3	A	— —	— —	— —	— —	0 0	— —	0 0	— —	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
4 to 5	4	A	— —	— —	— —	— —	— —	0 0	— —	0 0	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
5 to 6	5	A	— —	— —	— —	— —	— —	— —	0 0	— —	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
6 to 7	6	A	— —	— —	— —	— —	— —	— —	— —	0 0	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
7 to 8	7	A	— —	— —	— —	— —	— —	— —	— —	— —	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —
Totals	—	A	— —	0 0	0 0	0 0	0 0	0 0	0 0	0 0	— —
		D	— —	— —	— —	— —	— —	— —	— —	— —	— —

* Bachelors are treated whose children were not in the families on their visits upon which not be determined.

Table VII. Fertility Ratios and Gross Reproduction rates for Eighteen Countries*

Country	Year	Fertility ratio†	G.R.R.

* From the League of Nations Statistical Yearbook, 1939/40. Only those countries which showed gross reproduction rates based on three census data and in which adequate age groupings were used.

† Live-born until the age-limits up to the three calculations.

There is, as one would expect, a close association of the fertility ratio with the gross reproduction-rate. In fact, the product moment correlation coefficient for this series of data is $+0.998 \pm 0.001$. By fitting a straight line to the series of points it is possible to make an estimate of what we could expect the Yao gross reproduction-rate to be on the basis of a fertility ratio of 738. When this is done, the expected gross reproduction-rate falls between 1·39 and 1·43.[1] It is not suggested that this figure is a reliable estimate, since the mortality rate in the first five years of life must affect the association between the two measures. There are almost certainly differences in this respect between the relatively advanced countries, used to derive this estimate, and the people with whom this paper is concerned. This estimate is used here merely to check the estimate of the gross reproduction-rate arrived at by other means, having such procedure on the assumption that differences in child mortality are not sufficient seriously to upset the correlation.

(c) *The Number of Children born to Mothers*

Table VIII shows the number of children born alive to women in the sample by age-groups. The Colwicks, in their survey of population in Ulanga District in

TABLE VIII. *Numbers of Live-born Children to Women of All Ages*

Age-group	No.	0	No. of live-births									Totals			Rate per woman		
			1	2	3	4	5	6	7	8	9	10+	f_x	g_x	T	f_x	g_x	T
15-19	11	10	1	—	—	—	—	—	—	—	—	—	1	—	1	0·09	0·00	0·09
20-24	24	18	2	3	—	—	—	—	—	—	—	—	6	5	11	0·25	0·17	0·33
25-29	28	5	11	6	6	—	—	—	—	—	—	—	18	22	40	0·64	0·79	1·43
30-34	31	9	10	8	3	1	0	—	—	—	0	—	37	68	105	1·19	2·19	3·38
35-39	19	3	2	4	6	0	0	0	—	—	—	—	40	42	82	2·11	2·21	4·32
40-44	18	—	2	2	2	3	0	0	0	—	—	—	30	44	74	1·67	2·44	4·11
45-49	10	—	0	0	2	0	0	0	0	—	—	—	17	30	47	1·70	3·00	4·70
50-54	9	—	0	—	0	—	0	—	0	0	0	5+	24	22	46	2·67	2·44	5·11
55-59	8	—	0	0	—	0	0	0	—	0	0	5+	23	23	46	2·88	2·88	5·75
60-64	9	—	0	0	0	—	0	0	0	—	0	4+	18	23	41	2·00	2·56	4·56
65-69	9	1	—	0	0	0	—	0	0	0	0	—	16	23	39	1·78	2·56	4·33
70+	19	—	—	0	0	0	0	—	0	0	0	3+	36	60	96	3·00	5·00	8·00
?	6	1	—	—	0	—	0	0	—	—	—	—	14	13	26	2·34	2·00	4·34
Total	1265	55	28	23	30	16	13	9	3	6	6	5+	326	380	714	1·30	1·52	2·80

* Eleven live births. † Ten live births. ‡ Eleven live births. § Two mothers with ten live births and one with twelve live births. ¶ Excludes six women whose ages are unknown.

Tanganyika Territory, calculated the average number of live births per woman at various ages. These were as follows (Yao figures for comparison):

	Ulanga	Yao
Under 20	0·50	0·17
20-30	1·59	2·07
30-50	2·49	3·82
Over 50	3·13	3·50

This seems to support their conclusion that the birth-rate had suffered during the

[1] The equation for the regression line is $Y =$ [illegible] is 0·13. A range of two standard errors was used [illegible] in this estimate. [illegible] fertility ratio. The standard error of the estimate

6: Mitchell E-5 (1946-1947) 1949 FTT Yao FTT

last twenty to thirty years, and that it was then returning to normal since the number of live births in the under-30 age-groups agree in the two surveys, but the figure for the over-30 age-groups is substantially lower for the Tanganyika material than for the Yao.

The Culwicks, Fortes, and Schapera have used the number of live females born to women past child-bearing as an indicator of the gross reproduction-rate. It was not possible to record whether the women in this sample had passed the menopause or not. From Table VIII we see that there is no upward trend in live births per woman over the age of 30. We may therefore take this age as representing the age at which child-bearing ceased. There were 45 women over the age of 50 and they had between them borne 133 live females. This is an average of 2·13 per female. This differs substantially from the figure that the Culwicks arrive at in their study, viz. 1·56.[1] It agrees, however, with the estimates made for the Tallensi (2·1)[2] and for the Tswana (2·34).[3]

There are, however, some serious objections to the use of this figure as a measure of the prevailing gross reproduction-rate. First, it does not take into account those mothers who did not survive the child-bearing period. If it is only the most fecund who die before menopause, we are, in fact, dealing with a sample which is unrepresentative, in that the least fecund are automatically selected. The opposite may also be true, of course, but the fact remains that such an estimate is based on an unrepresentative sample of mothers. Second, it represents the average fertility prevailing over the last fifty or sixty years. If there has been a large change in the fertility at some time during this period, this is included in the average and obscures the rate which prevails *now*. For example, the material presented by the Culwicks shows that the gross reproduction-rate must be higher than 1·56. The low figure in this case, they suggest, is caused by the famine which followed a rebellion in 1906.

(d) A More Direct Estimate of Fertility

In order to arrive at a figure which would reflect conditions prevailing more recently, a series of tables was constructed, which showed (according to my census sheets) the number of children born in each year between 1917 and 1946, and the number of women in the different five-year age-groups for each of those years. Hence each woman who appeared in the first year (1917) was also counted in 1918. As each new year was considered some had turned 50 and were excluded, and others had turned 15 and were included. Therefore a gross reproduction-rate was calculated for each year from 1917 to 1946. These rates were averaged by adding together the number of women shown in each five-year age-group for five years and adding the number of children born during those five years, and by dividing to arrive at average specific fertility rates. The five-year averages were as follows:

1917–21	4·18	1932–6	2·23
1922–6	3·33	1937–41	3·22
1927–31	3·12	1942–6	2·83

There appears to have been a definite trend in this series, falling from the end of the

[1] The total of 5·13 children per woman was divided by 2 in order to arrive at the number of females per woman.

[2] M. Fortes, op. cit., p. 108.

[3] I. Schapera, op. cit., p. 23.

but was to a trough in 1931-4 and then beginning to rise again. However, with a sample so small as this one, and since we are relying on memory for most of this information, it would be unwise to accept this as significant. These tables have in turn been combined into three tables each covering one ten-year period from 1917 to 1946. These are shown in Table IX.

TABLE IX. *Average Gross Reproduction-rates in Ten-year Periods since 1917 to 1946*

Ages of women	1917-26			1927-36			1937-46		
	No. of women	No. of live-born females	Annual average specific fecundity rate	No. of women	No. of live-born females	Annual average specific fecundity rate	No. of women	No. of live-born females	Annual average specific fecundity rate
15-19	89	1	0.056	188	6	0.256	148	2	0.054
20-24	172	15	0.874	227	48	0.883	229	21	0.684
25-29	149	11	0.683	202	16	0.580	227	39	0.948
30-34	78	10	0.513	175	13	0.474	223	23	0.516
35-39	71	11	0.773	149	10	0.559	207	14	0.339
40-44	54	13	0.758	78	6	0.256	173	10	0.347
45-49	40	10	0.500	51	1	0.040	108	4	0.074
50-54†	28	3	0.277	30	1	0.133	78	4	0.256
Totals			0.810			0.525			0.798
G.R.R.			0.510			0.813			0.990

* This does not mean that these totals represent the size of the sample. This is an average size and some women have been counted more than once.

† These rates are higher than might be expected. There appears to be no special reason why these rates should be so high, and the explanation probably lies in the smallness of the sample.

The obvious deficiency in this set of data is that the women who died are not included, and since many more of the 1917-21 cohort (i.e. those women who were in the child-bearing ages in that period) have died than, say, for the 1937-41 period, the rates calculated for earlier periods become more and more unreliable. There seems

TABLE X. *Average Gross Reproduction-rates over Ten-year Period 1937-46*

Age groups	1937-46			1938-47			1939-48		
	Women	Girls	Rate	Women	Girls	Rate	Women	Girls	Rate
15-19	60	..	..	68	0	0.000	118	0	0.016
20-24	1383	03	0.065	1441	8	0.056	1407	01	0.063
25-29	1111	14	0.630	1383	23	0.166	1386	39	0.698
30-34	1141	18	0.527	1111	21	0.194	1144	39	0.716
35-39	956	11	0.345	1063	11	0.088	1103	24	0.196
40-44	781	3	0.053	941	6	0.064	1189	11	0.093
45-49	611	1	0.030	887	3	0.038	1193	8	0.080
50-54*	517	4	0.108	911	2	0.048	1178	6	0.076
Totals			0.618			0.763			0.799
G.R.R.			1.030			1.613			0.983

no way of circumventing this difficulty for the earlier periods, but some correction for this may be included in the 1937-46 rates. All those women who were in the child-bearing ages when they died between 1937 and 1946 were extracted and

4: Mitchell E-S (1946-1947) 1949 FT7 Yao FT7

included in the material that was prepared for Table IX. In this way it was possible to construct Table X which shows as close an approximation as we can get to the gross reproduction-rate from the material on hand.

Since the exact date of death was unknown (i.e. day and month) it was assumed that at death the women were at the mid-point of the age-group. Therefore the figure 158·5 in Table X represents, for example, 105, 158 women who passed through one particular year and 1 woman who died in that year.

The revised rates for the two five-year periods 1937-41 and 1940-4 are not greatly different from those calculated without taking account of the women who died. The average gross reproduction-rate over the ten-year period 1937-46 falls within the limits of expected gross reproduction-rate as calculated from the fertility ratio (2·47 to 2·93; see p. 313), and is not widely different from the estimate derived from women who have passed child-bearing (3·13; see p. 314).

(c) *General Conclusions about the Gross Reproduction-rate*

In general we may observe that from the material on hand the gross reproduction-rate for this sample has always been high. This is confirmed since, first, the number of live-born females born to women over the age of 50 is high (3·13); second, the lowest rate calculated for the past is 2·25 for 1932-6, though not too much reliance should be placed on the validity of this; and third, the rate calculated for the last five years which, since necessities of dead children would still be fresh, is probably quite accurate, is 2·83.

With a sample as small as the one used in this survey a certain amount of variability is to be expected. Also since all ages are merely estimations based on the memory of informants, one can only expect approximations over fairly long periods of time. For this reason it is probably safer to use the five-year average 1940-4 as an indicator of the present gross reproduction-rate, or even the ten-year average 1937-46. In this case, we may estimate the present gross reproduction-rate at about 2·8 or 2·9.

4. The Net Reproduction-rate

Of course, no mortality statistics for the African population are available. Hence it is necessary to construct a make-shift survival table in order to arrive at some estimate of the net reproduction-rate. This is set out in Table XI. In this table I have assumed that the mean age of each five-year group is 3 years older than the lowest age in that group, i.e. the mean age of the 35-9 age-group is 38. It would have been more consistent to take this mean to be 37·5, but since the ages at death are not accurately known there seemed little point in doing this.

The problem then becomes: what proportion of girls born to mothers of average age 28 years (for example), i.e. to the 25-9 year age-group, will themselves survive to be 28 years of age?

In order to arrive at this proportion all the girls born between 1934 and 1943 who were recorded on family census forms were abstracted, i.e. 131. Of these 16 died before reaching the age of 4, so that we can assume that 85 per cent. survived to the age of 4 and over. For the mortality of the children between 4 and 8, those born between 1929 and 1938 were considered. There were 111 of these, but 14 died before reaching the age of 4. Hence we consider only 98 (as recorded in column iii

of Table XI) as surviving to the age of 4 and beyond. Of these, 1 died before they entered it (see column v) which indicates a survival of 98 per cent. for this period. It will be remembered that 89 per cent. of all girls born alive survived to be 4 years old, and now we know that 98 per cent. of these lived to be 8 years old. Hence,

TABLE XI. *Survival Table: Females*

Year of birth of females	Age last birthday through which females born in years 8 and 1 have survived and passed through (age of that)	No. of females surviving age last birthday	No. of females who died before passing age of age group	No. of females who survived through age group	Per cent. of females who survived through age group	Survival rate	Smoothed values
i	ii	iii	iv	v	vi	vii	viii
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

we can say that 89 x 98 — 87 per cent. of all children survive to be 8 years old (see column viii of Table XI). These points were then plotted and the curve smoothed by hand. Smoothed values for the same ages, i.e. for 1913, 1912, &c., were then read off and are recorded in column viii of Table XI. These smoothed values represent the survival-rate over the last 13 years and may now be applied to the gross reproduction-rate for roughly the same period, i.e. for the period 1937-46 in Table IX. This is done in Table XII.

TABLE XII. *Net Reproduction-rate: Average 1937-46*

Age group	Female fertility-rates	Survival rate	Smoothed fertility-rates
i	ii	iii	iv
[illegible]	[illegible]	[illegible]	[illegible]
		Net reproduction-rate	1·149

The sum of column iv in Table XII (1·1) is the net reproduction-rate. This figure is obviously high, and we may look for the error in the possibility that some females who died are not recorded so that the mortality rate is underestimated. However, there seems to be sufficient evidence to conclude that the replacement rate is high.

This is partly confirmed by the fact that the increase in total population for parts of the Livonde district, with which this survey was concerned, according to the official census, is about 2·6 per cent. per annum.[1] At this rate we could expect the population to double itself in about 26 years. A net reproduction rate of 2 would mean that the population would double itself in one generation which we may take in this case to be about 25 years. Some of the increase shown in the census is no doubt due to immigration from Portuguese East Africa, but the high replacement rate suggested by this material tends to confirm the opinion of one Administrative official, who maintained that immigration has virtually ceased since 1940.

5. General Remarks and Conclusion

From material collected in three groups of families in Livonde district of Southern Nyasaland it appears that the average gross reproduction rate within the sample over the last ten years was about 2·3 while the net reproduction rate was about 2·1.

There is no reason to suppose that the fertility of this sample is vastly different from that in any other part of the district, since the families visited were casually selected; nevertheless, the sample is not a random one (in the statistical sense) and it is unsafe to generalise from it.

The Nyasaland Administration has only recently introduced machinery for the registration of births and deaths.[2] Until, therefore, these statistics are collected there seems to be no alternative but to rely on estimates as uncertain as those made in this paper.

[1] The population of Kasinga, Livonde, and Mpondi sections of what was formerly known as Livonde district or Upper Shire District of Nyasaland, increased from 99,170 in 1938 to 84,800 in 1945. Extracted from the trade returns returns in the D.C.'s office in Livonde.

[2] Actually the forms for the registration do not mention all the categories of information necessary for the calculation of the gross and net reproduction rates. Such calculations are mainly of the type of the numbers and ages at death, and they have been established, no doubt, because it is assumed that this information is unobtainable. It is to be hoped, however, that when the system has become established, these categories will be introduced.

Résumé

MALÉDICTIONS DES MORTS (see p. 16)

L'auteur cite de nombreux exemples des malédictions employées pendant les rites et indique l'importance comparative (?) accordée, suivant le degré de parenté entre la personne qui prononce la malédiction et celle à laquelle elle est destinée. La malédiction des morts est plus redoutée que celle des vivants, et l'on s'attend à ce qu'un homme qui supporte un tort laisse le sentiment d'avoir subi une injustice tant qu'il n'a pas entendu de sa veuve quelque malédiction. Une malédiction prononcée n'affectionne que rarement le lointain parent mais elle est bientôt suivie à mort la ligne en ligne ascendante à l'individu. Pour être efficace, la malédiction n'est pas besoin d'être explicative ou parolée — une imprécation silencieuse, ou même un sentiment de dépit, peuvent avoir la même force qu'une malédiction prononcée.